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ON CHLORIDE OF MERCURETHYL.

By J. M. Maisch.

This compound, it appears, has recently been introduced in Europe into medicine, and it is claimed for it that it may be used in the same doses and for the same purposes as corrosive sublimate, over which it has the advantage of not precipitating albumen, no matter in what solution the latter may be, whether as egg albumen, in the serum of blood, in urine, etc. Schering & Co. have introduced it under the name of *Hydrargyrum æthylochloratum.*

It was discovered by Strecker* and by Dünhaupt† in 1854. The former chemist started with iodide of ethyl, preparing therefrom as the first step the iodide of mercurethyl; the process of the latter involves the previous preparation of bismuth-triethyl, which, being decomposed by corrosive sublimate, yields the compound in question, besides chloride of bismuth-ethyl. Whichever course is followed, the process, or rather series of processes, are tedious and complicated; but that of Strecker appears to offer better advantages in utilizing all the material.

Iodide of ethyl or hydriodic ether = C_4H_5I, was discovered by Gay-Lussac in 1815, and prepared by distilling absolute alcohol with hydriodic acid, and separating the compound from the distillate by water. Serullas‡ subsequently improved the process by using iodine and phosphorus with alcohol, and Personne§ found the use of amor-

* Ann. d. Chem. und Pharm. xcii, 57. † Journ. f. prakt Chemie, lxi, 399.
‡ Ann. de Chim. et de Phys. xxv, 323; xlii, 119.
§ Compt. rend. lii, 468.

phous (instead of ordinary) phosphorus very advantageous, using again absolute alcohol. The latter process was rendered more practical in 1862 by Reith and Beilstein,* who proposed to put one part of red phosphorus into five per cent. of alcohol, spec. grav. 0.83, placing the flask with the mixture into cold water, adding 10 parts of iodine, distilling after 24 hours, shaking the distillate with soda solution, and removing the oily liquid which is rendered anhydrous and rectified. Lieben communicated, in 1868, to the Vienna Academy of Sciences, his observations that the chlorides of the alcohol radicals are converted into the iodides on being heated to about 130° C., with an excess of concentrated hydriodic acid. Wanklyn† and De Vrij‡ have simplified the preparation of iodide of ethyl very much by using absolute alcohol, to which a little more than one molecular weight of iodide of potassium is added, after which dry hydrochloric acid gas is passed into the liquid; or the hydrochloric acid is first passed into the alcohol and sufficient iodide of potassium added afterwards; after 24 hours the mixture is distilled, the iodide of ethyl separated by water and purified by washing, drying and rectifying.

Iodide of ethyl is a colorless oily liquid of 1.93 spec. grav. at 15° C. (60° F.), of a strong and peculiar odor, and boiling at about 70° C. (158° F.) When digested with mercury or some other metals, ethyl compounds of the metals are obtained. In this manner and by taking advantage of the influence of diffused light, Strecker prepares the iodide of mercurethyl, recrystallizing the product from alcoholic ether. It forms then colorless iridescent scales, subliming at the temperature of boiling water, fusing at a higher temperature, of an unpleasant odor, and being decomposed by direct sunlight finally into mercuric iodide; its composition is C_4H_5HgI. If its alcoholic solution is precipitated by nitrate of silver and the filtrate carefully evaporated, crystals or a crystalline mass of nitrate of mercurethyl are obtained, which is readily soluble in water and almost as freely in alcohol.

This nitrate is easily converted into the chloride by adding to the aqueous solution of the former, muriatic acid or chloride of sodium, nitric acid, or in the latter case nitrate of sodium being separated in the aqueous solution.

Chloride of mercurethyl has the composition of C_4H_5HgCl; it

* Ann. d. Chem. und Pharm., cxxvi, 250.
Polyt. Centralbl. 1867, 675. ‡ N. Jahrb. f. Pharm. xxxi, 169.

forms white thin scales with an almost silvery lustre, and of a peculiar ethereal unpleasant odor; it is very sparingly soluble in cold water, little in ether and cold alcohol, but freely in boiling alcohol, crystallizing again on cooling; it sublimes at 40° C. (122° F.) without fusing previously, and condenses in thin laminæ; exposed to the air it evaporates completely, and heated in a water-bath it may be fused to a clear oily liquid, which evaporates without leaving any residue. When rapidly heated upon platinum foil it burns with a slight flame, the vapors having a disagreeable odor and a metallic taste. Being very poisonous, it must be handled with great care on account of its ready volatility. Schering regards it as pure if it is readily and completely volatilized, dissolves without residue in boiling alcohol, yields in alcoholic solution but a faint reaction of chlorine, and, with alkali, does not produce a precipitate.

It remains to be seen whether its inactivity upon albumen renders this new claimant for medical favor so much superior to corrosive sublimate and similar mercurials, that its good qualities would more than outweigh the dangers and uncertainties that must result from its ready volatility at our usual summer temperature.

THE NIGHT-BELL.

By J. B. Moore.

The night-bell, to many, may appear a strange subject for an article for publication in a pharmaceutic journal; but, as it is so intimately connected with the night or after-hours' business of the pharmacist, I thought a few words concerning the role it plays in that unpleasant part of our business would not be out of place nor uninteresting to the readers of this journal.

The remarks that follow, however, will not so immediately concern the night-bell itself as they will relate to the business with which it is so intimately associated.

Answering the night-bell is a duty among the most unpleasant connected with the business of pharmacy. It not only interferes with our comfort, but in some instances impairs our health; it, nevertheless, is *inseparably* connected with and forms an *integrant* part of our business, and the physician might as well refuse to attend to his night-calls as for the pharmacist to refuse to respond to the call of the night-bell. This duty should therefore be accepted, and promptly

and cheerfully performed, by every member of our profession who pursues this calling with the right spirit, and with the determination to do his whole duty.

Many pharmacists answer the night-bell very reluctantly, and some will rarely respond to its unwelcome ring, and when they do will hardly treat a nocturnal customer with common courtesy, while there are some who never attend to any night business whatever; that distasteful part of their legitimate duties they seem to ignore entirely, and leave it to their neighbors to perform. After they lock their doors at night their shops are as impregnable to a suffering customer as would be the citadel of a beleaguered city to a corporal's guard. After they close their doors at night they, as it were, commend their customers to the mercy of circumstances. If an individual swallows, in the night, laudanum or other poisonous or deleterious substance, by mistake, he can get relief as best he can, so far as they are concerned; or if any one should be attacked with hemorrhage, or should meet with some accident that would imperil life if immediate and prompt relief could not be procured; or if a person should be seized with cholera morbus, colic or other painful or dangerous malady—they must obtain relief in the best way they can, or suffer until morning, or perhaps die. How a successful prescription business can be done under such management I cannot understand. Surely the pharmacist guilty of such utter disregard of his duty and the interests of his customers is not deserving of the patronage of any community.

Aside from the kindly sympathies and the humane promptings of our nature, there are also business interests involved in this matter which should commend it to the favorable consideration of all who desire success in the business of pharmacy, as none of us can tell what influence the prompt and polite attention to our night business may exert upon the general business of our store.

Every young man who contemplates choosing pharmacy as his business, if he is not already aware of the labors and various onerous duties which belong thereto, he should be fully and candidly informed of them by his intended preceptor before he enters upon his apprenticeship, and the night business should *especially* be impressed upon his mind as one of the most important and unpleasant parts of his duties. Then, if he demurs, and seems to think that he cannot accept and perform cheerfully all the legitimate demands of the business, he should, thus at the threshold, abstain from entering the arena

of such a self-sacrificing and responsible vocation, and should be advised to turn his attention to some other calling more in accord with his tastes.

The petulance and ill-temper frequently manifested by pharmacists when called up at night are very unbecoming, and are evidences of the lack of the right spirit, and often cause the loss of a good customer, as persons are not likely to patronize a drug-store in day time where they are treated with discourtesy when compelled by necessity to call at night. People rarely visit a drug-store between midnight and five o'clock in the morning for any article of medicine, no matter how important or how trifling, unless they absolutely need it. No man, woman or child will willingly and unnecessarily arise from their bed, and walk perhaps four or five squares, or even, in some instances, eight or ten squares, to a drug-store for an article, and that, too, probably, in the dead hour of night, unless they were prompted by what they consider immediate and imperative necessity; and, whether they really need it or not, if they think they do, that is a sufficient justification and excuse for their calling the pharmacist up, no matter at what hour or how trifling the want. There are, of course, none of us who like to have our rest broken, or to have our sweet slumbers disturbed by the noisy tongue of the night-bell, but the duty to which it summons us is a legitimate part of our business, and we should therefore not feel too much annoyed at such occurrences.

We should all be humane and charitable towards our nocturnal visitors, for they are generally brought to our door either by real or imaginary necessity. We cannot expect everybody to be as wise as ourselves in matters relating to physic and disease. We must make due allowance for the prevailing ignorance of the public in such matters. If the public were all doctors or pharmacists, we, perhaps, would not have our hours of rest so frequently invaded. A child, perhaps, is suddenly taken ill, in the middle of the night, with pain in the stomach, and begins to cry; or has taken a slight cold, and has a little fever; or is threatened with croup or some other disease, and although, to a practiced or professional eye that has a knowledge of disease, the symptoms would not be at all alarming, since it would see in a minute that there was no immediate danger, or the slightest necessity for immediate medical aid, yet the excited parent, who is not capable of judging of the magnitude of the danger, becoming

alarmed and seized with dread apprehensions, starts immediately for a physician and thence to the drug-store, or else he at once proceeds to the latter for some article which experience has taught him is useful in such cases. Now, I contend that it would be a sad state of affairs if the anxious and affrighted parent could not gain admittance to any neighboring pharmacy to obtain the much-coveted boon, in the form, perhaps, of five or ten cents' worth of paregoric, laudanum, sweet spirit of nitre, hive syrup, syr. ipecac, lime water, or other simple remedy; or, if the physician has been sought, and the medicine cannot be procured, the attendance and skill of the physician are expended in vain.

Yet there are but few pharmacists who seem to view the matter of their night business in the right light, or deal with it in the right spirit. We are aware that there are many calls made upon us at night, after business hours, for medicines that are entirely unnecessary, or at least for which there is no immediate need; but we must also remember that there are many similar calls made upon us by the public in day time which may be placed in the same category, and which go to make up, perhaps, no small share of our sales, and contribute to a very great extent to supply us with the comforts of life. But these calls are made at a time when they are more pleasurably tolerated.

Some pharmacists will never get up at night to answer any call, unless it is for medicine on a prescription, just as though no medicine was ever needed to relieve pain and suffering, or to cure disease, but what was directed in the prescription of a physician. Such an idea and such a practice are simply ridiculous.

I have had people to not unfrequently call at my store late in the night for medicine, and tell me that they had come eight or ten squares, and had tried to gain admittance at every drug store on their way, but failed to get any one up. I have frequently secured good customers in this way far remote from my own store. People usually feel very grateful to you for such an accommodation. They feel that you have proved a friend in need.

It is important, also, when called on for medicine at night, to admit the customer as quickly as possible, and not to keep the person waiting at your door longer than cannot be avoided, especially in cold and inclement weather, and more particularly if the applicant be a woman or child, for they are naturally timid and often much afraid to be out

in the street at a late and lonely hour of the night. Five minutes in waiting outside, and that, perhaps, in the cold and rain, will seem to them as long as fifteen or twenty-minutes to you who are inside, especially if the call be an urgent one. This is why customers are often so impatient, and annoy the pharmacist so frequently by their continued or frequent ringing of the bell or knocking at the door, if the call is not answered at once. The moment the night bell is rung or a knock is made at the door, it should be immediately responded to by answering through the speaking tube, if such a convenience is at hand, or from the window. This will prevent impatience, and the customer will wait contentedly at the door, and give you time to hastily arrange your toilet.

I am well aware that the patience of pharmacists is often sorely tried by these night callers, and there is often great excuse for our sometimes becoming vexed at the frequent interruptions of our rest. After we have been on our feet the whole day long, and wearied and fatigued both in body and mind by the labors and anxieties of the business of the day, and the

> "Soul is quite weighed down with cares, and asks
> The soft refreshment of a moment's sleep,"

then it is when we have retired to our couch of repose, and, perhaps, have just got fairly into a doze, that we are suddenly awakened by the tingle of the night bell, which, at first, falls upon the tympanum "like the soft sweet music of a dream," but in a moment arouses us to the consciousness that it is the unwelcome ring of the horrid night bell. I know that under such circumstances we cannot but occasionally instinctively and irresistably feel provoked and cross at all mankind, to think that even at night, at hours when all the world is hushed in slumber and almost all can enjoy their rest undisturbed, the poor apothecary is denied this privilege, which makes us not unfrequently wish that we had in early life chosen some other calling. But such feelings of dislike or aversion to the performance of any part of our necessary duties, no matter how unpleasant, should not be encouraged nor allowed a permanent lodgment in our bosoms, but should be repressed and, if possible, extinguished, or, if not, they will "grow with our growth, and strengthen with our strength," until finally every unpleasant duty that interferes with our comfort or abridges our pleasure will become distasteful to us, and will be performed with reluctance and indifference. Therefore, from our

commencement in business we should endeavor to educate ourselves to accept and perform every duty pertaining to our vocation with cheerfulness and alacrity. By persevering in such efforts we will finally establish within ourselves a bulwark against such feelings.

It must be borne in mind that every business of life has its unpleasant features; and while ours has its full share, it also must have corresponding charms for its votaries, as it appears that when a man once becomes a pharmacist he always remains one, for we seldom see him quit it to embark in any other business.

While we are gravely and lamentingly contemplating the long hours and the many annoying and onerous duties of our business, we can gather consolation if we will but observe the labor and long hours of our corner grocer. We will then see that we have a comparatively easy business. He is on his feet, hard at work, all day long; his store is open as late at night as ours, and in the morning, while we are yet slumbering, he is by daylight at his post, with his store open and business in full blast, selling to the industrious housewife, from a penny's worth of wood for her morning fire to the choicest mackerel for breakfast.

I have, in common with my colleagues, experienced all of the many annoying features of the night business in all their multifarious forms. Perhaps, on the approach of day, before the nightingale has ceased her joyous notes, or the cock has raised his clarion voice to greet the first faint gleam of "meek-eyed Morn," a pull of the night bell or a rap at the door may awake you from your much-needed morning nap and summon you to your post. You, as quickly as possible, present yourself at the door, and salute your premature visitor in the most agreeable manner consistent with your inward thoughts and feelings. Without offering any apology for disturbing you at such an unseasonable hour, he, perhaps, with the greatest *sang-froid*, asks you if you can change him a five dollar note, or says that he will take some postage stamps, or a few good segars, or that he wishes a Seidlitz powder, or other equally trifling article; or, probably he may ask you if you know where Mr. So and So has removed to, who used to live in this neighborhood.

This is not an overdrawn picture or description of some of the scenes which occasionally take place in drug stores. Similar instances have occurred in my own experience. People guilty of such improprieties usually belong to the class of early risers, who think

that everybody else, like themselves, should rise with the lark. Now I have very little patience with, and no sympathy for, such people, and in such cases I usually administer to the guilty party, in a calm but emphatic manner, without any outward manifestation of anger, a suitable rebuke. I generally say to them: "I am surprised that you should call me up at such an unseasonable hour in the morning for so trifling an article, that you could so easily have done without until I had opened my store." I say furthermore to them: "I am always willing, and will at any time, with pleasure, get up at any hour of the night to furnish you with any article of medicine or medical appliance that I have and that you might require in any case of emergency in sickness occuring at night, but I will not permit myself to be thus disturbed of my rest at so early an hour in the morning on so trifling a pretext." A little calm and plain talk of this kind does not always offend, and yet serves as a good and wholesome lesson to the individual, and prevents the repetition of the offence.

The calls that we have made upon us after business hours, which may be classed in the category of unwarranted and unnecessary, usually occur either in the early part of the night, before half past twelve o'clock, or in the early morning, between five o'clock and our usual hour for opening.

These calls are usually made by careless, thoughtless, inconsiderate, and often ignorant people, who may, in summer, be seen sitting around on their door steps until midnight, chatting, neglectful of their little wants in the way of medicine they desire to take before retiring or when they arise in the morning, hence, are obliged to call the pharmacist up after he has retired to rest, or before his usual opening hour in the morning. It is to this class of untimely visitors that a few well-timed words of chastisement and rebuke should be courteously administered.

Some pharmacists make it a rule to charge more for their services at night, and after mature consideration, I don't know but that this is perfectly right, for we should be paid for our labor in proportion to its magnitude and the personal sacrifices connected with its performance. The physician usually, I believe, charges more for his visits by night than for those which he makes by day, and I, therefore, cannot see any reason why the pharmacist is not justifiable in following the same rule. Of course, in adjusting our charges, we

should be governed by the apparent circumstances of each particular case. If the person is very poor we should be very considerate, and as moderate as possible in our charges, otherwise we may do great injustice to poverty and overtax the necessities of poor and deserving people. But, notwithstanding, I cannot but think that an advance in our prices on our *night* sales is perfectly justifiable, although it has formerly always been a rule with me to make no extra charge at night, and that rule has been rarely departed from in my store.

I, for many years, attended to answering the night bell or night calls myself, but of late years have delegated that duty to my prescription clerk, and have always insisted upon a prompt and polite attention to the duty. As men advance in life they cannot so well afford to have their rest broken, as when once disturbed they cannot so readily get asleep as when younger. Most young men, however, can usually fall asleep the moment their head touches the pillow.

I have been induced to write upon this subject, believing it to be one of universal importance and interest to our profession, and which, moreover, has heretofore not received that just and intelligent consideration that its importance deserves, and to which its place in the business of the pharmacist entitles it. And if I have succeeded in impressing the points here made upon any of the younger members of the profession, who are especially liable to overlook them, I shall not have penned this article in vain.

Philadelphia, July, 1873.

ON AROMATIC TINCTURE OF ASSAFŒTIDA.

By L. Myers Connor.

This tincture has such an unpleasant smell and nauseating taste, that it cannot be given in every case required. Frequent requests of physicians to prepare a tincture that would be more pleasant to the taste and produce the same effect without the addition of water, have induced me to make some experiments. The formula offered has been tried, the aromatics being no objection, either in properties or preparation; it can be made at any time, also keeps well.

R.	Tinct. Assafœtida, U. S. P., . .	℥viij,
	" Orange-peel, " . .	℥ij,
	Ess. Peppermint, . . .	℥iij.

Mix. Dose, one and a half to two fluid-drachms, without the addition of water.

Dallas, Texas, June 18, 1873.

ANALYSIS OF OSHA ROOT.

By Herman Haupt, Jr.

Abstract from the author's Inaugural Essay.

This New-Mexican umbelliferous root, the botanical origin of which is still unknown, has been noticed in the *American Journal of Pharmacy*, 1867, p. 202, and 1868, p. 106. The material for the following experiments had been received from Mr. Jacob Krummeck, of Santa Fé, through Prof. Maisch.

On leaving a canton flannel strainer in contact with a hot decoction of the root, the woollen fibres of the strainer were observed to be dyed a reddish brown color, while the cotton fibres remained white. Dilute sulphuric acid changed the color to yellowish-brown (snuff color), alum solution (1 to 8) the same; solution of soda and of ferrous sulphate deepened the color considerably.

Sixteen ounces of the root in coarse powder were distilled with water; the distillate, at first clear, became turbid when quite cool, and separated volatile oil. The aqueous decoction, after the volatile compounds had been removed by distillation, was carefully evaporated to a syrupy consistence and treated with alcohol; the brown precipitate dissolved readily in water, the solution yielding with alcohol a white precipitate of gum, which, on exposure to the air, again assumed a brownish color.

A concentrated solution of this precipitate formed stiff jellies with solutions of ferric chloride and of borax; acetate of lead precipitated it white, the filtrate therefrom, after the removal of the lead by sulphuretted hydrogen, yielded, on evaporation, nearly white deliquescent crystals.

The alcoholic filtrate obtained as above from the decoction, reduced cupric oxide in alkaline solution at the boiling temperature, but not in the cold after standing for several hours; the reduction was probably due to some organic body aside from sugar.

The root exhausted by hot water was dried, when it weighed six and a half ounces; it was exhausted with strong alcohol, the tincture distilled and evaporated, and the residue successively treated with petroleum benzin, bisulphide of carbon and chloroform. On evaporating the last two solutions slowly, resinous masses were left behind without any sign of crystallization. Equal quantities of these resins dissolved in a like quantity of alcohol, gave solutions of a similar

brown shade, but much paler in the case of the bisulphide of carbon resin.

The solution in petroleum benzin separated, on standing, at first a brown resin, in appearance and behavior identical with that taken up by the chloroform, and after several days particles of fat. The benzin was evaporated, and the resulting oil cooled to 8° F., when it thickened slightly, but did not congeal. The oil was saponified, the soap converted into soda soap, and the fatty acids liberated by sulphuric acid; a brownish gelatinous mass was obtained, which dissolved in alcohol, leaving a small portion of oil behind which was readily taken up by bisulphide of carbon. The alcoholic solution yielded a precipitate with acetate of lead, which was soluble in ether, and on the evaporation of the solvent the oleate was obtained again as a yellowish semi-fluid mass.

The mother-liquor from the soap was evaporated, and yielded a dark colored liquid containing potassium and sodium salts. This liquid being difficult to purify, some fat was obtained from the root by treating it with hot benzin, then saponified with oxide of lead, and the mother-liquor purified by sulphuretted hydrogen and alcohol; the liquid finally obtained, although not quite colorless, had the properties of glycerin.

The volatile oil separated from the aqueous distillate mentioned above, was heavier than water, of a light yellow color and the sharp burning and aromatic taste of the root. Sodium acted upon the anhydrous oil with considerable violence, slender white needle-shaped crystals being separated on standing. Caustic potassa did not unite with this oil.

A portion of the aqueous distillate, from which the volatile oil had been separated, still retained considerable odor; it was repeatedly distilled from chloride of sodium and thus concentrated, the distillate was mixed with a concentrated solution of bisulphite of sodium and the mixture cooled by ice. No crystals being obtained, the absence of an aldehyde in the distillate was established.

The aqueous distillate being of an acid reaction, was neutralized with carbonate of sodium and concentrated by evaporation, when the color became quite dark. After purification by animal charcoal and alcohol and recrystallization, deliquescent crystals were obtained. The salt distilled with an excess of diluted sulphuric acid, yielded a colorless distillate of a pleasant aromatic odor, reminding of the oil

of cognac. When almost neutralized by soda, the solution gave no precipitates with sulphate of copper, ferric chloride and mercurous nitrate.

In order to compare this aromatic acid with angelic acid, the latter was prepared by Buchner's process, by exhausting angelica root with alcohol, evaporating the liquid, separating the balsam, washing it with water, exhausting it with solution of potassa, purifying the compound by repeated concentration and filtration, and distilling with sulphuric acid. Angelic acid was obtained in colorless needles, having a peculiar aromatic odor, reminding of valerian, and being sparingly soluble in cold, but freely in hot water. The lead salt was obtained in shining white plates. 0·07 grams of the lead angelate, having been previously dried at a moderate heat, was decomposed by sulphuric acid, yielding 0·052 grams lead sulphate, containing 0·0355 grams lead, which is equal to 54·7 per cent. oxide of lead in the angelate; theoretical percentage 55·17 (See Gmelin's Hand-Book).

Some Osha root was treated in precisely the same manner as the angelica root; the acid obtained did not crystallize. The lead salt was obtained in shining plates, which, on heating, fused into a transparent mass. It was dried together with the lead angelate; 0·02 grams of it yielded 0.019 grams sulphate, corresponding to 0·0129 grams lead and to 69·9 per cent. oxide of lead in the organic salt.

It seems clear from the results as given above that the acid of Osha root is not identical with angelic acid; it appears to be a new acid hitherto unknown, and to deserve to be distinguished by the name of *Oshaic acid.*

From 100 grains of the air-dried root 8 grains of ashes were obtained, containing iron, aluminum, sodium and potassium.

JERVIC ACID AND JERVATES.*

By Hermann Weppen.

The potassium and sodium salts are prepared by carefully neutralizing an aqueous solution of the acid with pure carbonate; the slightest excess of the latter causes the liquid to assume an intense yellow color. The solutions are evaporated spontaneously under a bell-glass over sulphuric acid. The potassium salt is yellowish, scarcely crys-

* Abstract of a paper published in Archiv d. Pharm., 1873, March.

talline; the soda salt is white, and consists of very thin needles. Both have an alkaline reaction, are insoluble in alcohol and ether, freely soluble in water, from which solution alcohol precipitates them finally crystalline. Composition: $C_{14}H_6O_{12}K_4+2H_2O$. The sodium jervate contains 3 molecules of water.

The jervates of the alkaline earths are obtained by carefully adding to a boiling solution of the acid, recently precipitated pure carbonate suspended in hot water, until it just ceases to be dissolved. The salts crystallize on cooling, are insoluble in alcohol, but slightly soluble in water; the solutions are neutral to test-paper. Composition: $C_{14}H_6O_{12}Ba_2$; the strontium jervate contains 1, the calcium salt 6 molecules of water.

An excess of nitrate of silver produces in aqueous solutions of jervic acid a crystalline precipitate $= C_{14}H_8O_{12}Ag_2+2H_2O_1$, which is freely soluble in hot water, is not colored when exposed to the direct sunlight, and not decomposed up to a temperature of 160° C.; the solution has an acid reaction. The neutral silver salt obtained by double decomposition of the hot solutions, crystallizes in fine needles, is affected by the light (at least while moist), and has a neutral reaction. It is $C_{14}H_6O_{12}Ag_4$.

The mercurous salt obtained by double decomposition has the same composition and contains 4 molecules of water, is crystalline and insoluble in water.

Jervic acid is a tetrabasic acid; a well-defined ether has not been obtained yet. Pelletier and Caventou regarded it as gallic acid; the latter, however, is monobasic and tetratomic. By doubling its molecule ($2C_7H_6O_5=C_{14}H_{12}O_{10}$), it will be seen that jervic acid, $C_{14}H_{10}O_{12}$, contains 2H less and 2O more than the former; and digallic acid, $C_{14}H_{10}O_9$, differs in composition from jervic acid merely by 3O. The question, whether these acids are related to each other, may probably be solved by the study of their derivatives.

The two acids differ from each other as follows:

Jervic Acid.	Gallic Acid.
Not fusible or sublimable.	Fusible with evolution of CO_2 and formation of pyrogallic and metagallic acids.
Soluble in 100 parts of cold and about 10 parts of boiling water.	Soluble in 100 parts of cold and 3 parts of boiling water.
Insoluble in ether, difficultly soluble in alcohol.	With difficulty soluble in ether, easily in alcohol.

Contains two molecules of water of crystallization.	Contains two molecules of water of crystallization.
With little ammonia no alteration; with much ammonia, lemon-yellow color.	Little ammonia turns it yellow, much ammonia red-brown.
With excess of potassa, lemon-yellow.	Excess of potassa, yellow, red, then brown.
With excess of baryta water, yellow precipitate.	With excess of baryta water, yellow; then blue solution with green-blue flocks.
With lime water, yellow precipitate.	With lime water, yellow; then violet-green solution with similar flocks.
With excess of calcium carbonate, yellow.	With excess of calcium carbonate, bluish; then indigo-blue solution; finally, green blue precipitate.
Sulphuric acid produces no visible change.	Sulphuric acid causes red solution of rufigallic acid.
Chloride of calcium produces no precipitate.	With chloride of calcium, yellow precipitate, with evolution of carbonic acid.
With ferric salts, no alteration in the cold; the liquid becomes darker brown on heating.	With ferric salts a blue solution, passing through green into brown.
Nitrate of silver yields a white precipitate, which does not decompose with separation of silver.	With nitrate of silver no precipitate; the solution separates metallic silver.

GLEANINGS FROM THE EUROPEAN JOURNALS.

By the Editor.

Estimation of alcohol in fusel oil.—Dr. G. L. Ulex, of Hamburg, recommends to distil from 100 c. c. of the suspected fusel oil 5 c. c., and to agitate the distillate with an equal volume of saturated solution of table salt. If, on standing, one-half or more is separated as an oily liquid, it is a reliable proof that the fusel oil contained less than 15 per cent. of proof spirit. If, however, a smaller quantity or no fusel oil is separated, an addition of proof spirit has taken place. A given quantity of fusel oil is then agitated with an equal volume of saturated solution of table salt, in which propylic and butylic alcohols are far less soluble than in water. After complete separation the salt solution is distilled, to recover the alcohol and estimate its amount.—*Pharmac. Zeitung*, 1873, No. 48.

Test for free alkalies and for tannic acid. V. Griessmayer.—If a

drop of a solution of tannin is mixed with 1 c. c. of $\frac{1}{100}$ normal solution of iodine the iodine color disappears instantly, gallic and hydriodic acids being formed. The iodine solution may be weaker, but must not be stronger, so that it is completely decolorized. If one drop of ammonia is now added, previously diluted to one-tenth its strength, or in place of it 1 c. c. of water having a very faint alkaline reaction, a brilliant red color, appearing carmine in reflected light, is produced, which remains unchanged for some time. This reaction is much more delicate than that produced by concentrated alkalies upon tannic or gallic acids, because the color is quite characteristic, and the liquid does not become darker, as in the absence of iodine.—*Ibid., from Zeitschr. f. Chemie.*

*Constituents of cubebs.**—C. F. Schulze has again examined the officinal cubebs, and arrived at results differing somewhat from those obtained by Bernatzik and Schmidt. The composition of cubebic acid was found to be $HO,C_{28}H_{15}O_7$, of its crystallized soda salt $NaO,C_{28}H_{15}O_7+4HO$. The brown neutral resin could not be obtained in crystals; it is of pilular consistence, softens readily, is easily soluble in ether and chloroform, but with difficulty in alcohol. Concentrated sulphuric acid forms with it a dirty brown mixture, which, on the addition of nitric acid, becomes purple, then violet, and finally brown. After continued exposure of the mixture to the air the coloration produced is not as bright and distinct.—*Archiv d. Pharm.*, 1873, May, 388–395.

Soft soap is frequently adulterated. According to J. B. Oster, the microscope detects these adulterations very readily, silicates, silicic acid, alumina, ruptured starch granules, &c. being plainly visible.—*Pharm. Cent. Halle*, 1873, No. 22.

Ozonized water, made by Krebs, Kroll & Co., of Berlin, has been again examined by Dr. Behrens, of Kiel, and by Dr. O. Jacobsen, both arriving at the conclusion that the examined water contained a little hypochlorous acid.—*Wittst. Viert. Schr.*, 1873, 230.

These results, together with those obtained by Prof. Boettger (Am. Journ. Pharmacy, 1872, 105) seem to indicate that the so-called ozone water of the above firm is not always of the same composition; at any

* See also Amer. Journal of Pharmacy, 1870, 222.

rate, it does not deserve its name. See also Am. Journ. Pharmacy, 1872, 396.

The test for balsam of Peru with solution of table salt (Am. Journ. Pharmacy, 1872, 106) appears to Werner to be unreliable, since artificial products may be prepared having a higher specific gravity than that solution. He recommends the test of the German Pharmacopœia as perfectly reliable; the balsam is triturated in a mortar with an equal part of sulphuric acid, and the mass afterwards repeatedly washed with water. Pure balsam leaves a hard residue, which breaks readily, while the product from adulterated balsam is either tough, or soft like an ointment. The operation requires about five minutes. *Ibid.*, 295.

Vegetable glue.—This name is applied to a mucilage of gum arabic, the adhesive properties of which have been considerably increased by adding to 250 grams (made of 2 parts of gum to 5 of water) 2 grams of crystallized sulphate of aluminum, previously dissolved in 20 grams of water. Alum has a similar effect, but in a less satisfactory degree. —*Pharm. Cent. Halle*, 1873, No. 24.

Impure chlorate of potassium has been met with by Dr. Godeffroy. The salt was pulverulent, and sold at a higher price than the pure crystallized. By fusing and igniting 12 troyounces of it a blackish mass was obtained, which, when treated with water, left a residue weighing 90 grains, and consisting of manganium with traces of iron; this corresponds to 2 per cent. of binoxide of manganese.—*Zeit. d. Oesterr. Apoth. Ver.*, 1873, No. 17.

Precipitation of magnesium.—Prof. Mohr has proven experimentally that the precipitation of magnesium from an ammoniacal solution is best effected by ammonio-phosphate of sodium (microcosmic salt), which produces at once the insoluble crystalline precipitate, while phosphate of sodium separates at first gelatinous phosphate of magnesium, which is only gradually converted into the crystalline ammonio-phosphate of magnesium.—*Zeitschr. f. Analyt. Chem.*, 1873, 36–39.

The bark of Azadirachta Indica or nim tree has been analyzed by J. Broughton, who separated from it a resin-like principle of the composition $C_{36}H_{50}O_{11}$. It is obtained by exhausting the bark with

60 per cent. alcohol, precipitating the tincture by water, exhausting the dried precipitate by benzol, evaporating, again exhausting by carbon disulphide, then by dry ether, and finally by absolute alcohol; the last exhaustion separates a white transparent crystallizable substance, probably a fat, certainly not the active principle or an alkaloid. Thus purified the resin is dark brown, somewhat soft, of agreeable smell, slightly soluble in water, entirely in all the foregoing solvents, insoluble in fixed oils, fusible at 92° C. The dilute solutions have a strongly bitter, but not disagreeable taste. Strong alkalies and sulphuric acid dissolve it with alteration. The author believes that it can scarcely possess antiperiodic febrifuge qualities, though it may be a good tonic.

Another bitter substance, apparently a hydrate of the former, has been separated from the bark and the leaves; it is far more soluble in water. The leaves likewise contain no alkaloid. The powerful smell of the tree is not due to a sulphuretted oil, as has been surmised; indeed, no essential oil could be obtained, although the aqueous distillate of the bark has the perfume of the tree.—*Pharm. Journ. and Trans.*, 1873, June 14, from *Madras Monthly Journ. of Med. Science.*

THE LAWS WHICH REGULATE THE DISTRIBUTION OF A SUBSTANCE BETWEEN TWO SOLVENTS.

By Berthelot and Jungfleisch.

Abstract by C. E. Groves, from Ann. Chim. Phys. [4], xxvi, 396–417.

Although chemists frequently resort to the purely physical process of extracting a substance dissolved in one liquid, by agitating it with another liquid not miscible with the first, the laws which govern this molecular action have not hitherto been studied.

The present essay consists of three parts: 1. Experiments on the distribution of a substance between two solvents, made in conjunction with Jungfleisch; 2. Theory of this distribution; 3. Experiments on the state of dissolved salts, made with L. de St. Martin.

The authors have studied the solubility of iodine and bromine in water and carbon disulphide, also of succinic, malic, tartaric, oxalic, acetic, benzoic, sulphuric and hydrochloric acids, and ammonia in water, and in ether. The method of experimenting was to dissolve the substance in one of the liquids, and then agitate it with a known

volume of the other, the amount of substance being determined in each of the superposed liquids when they had become saturated.

It is found that when a substance is simultaneously in presence of two solvents, the quantities dissolved by equal volumes of the two liquids have a constant ratio, which is called the *co-efficient of distribution*, and is independent of the relative volumes of the two solvents, but varies with the degree of concentration, and with the temperature. In the case of succinic acid, a decrease of temperature causes a diminution of the co efficient of distribution, and the same effect is produced by dilution. With oxalic, malic, tartaric, and acetic acids, on the contrary, the co-efficient increases with the dilution, and the same with ammonia. The co-efficient for iodine, with water and carbon disulphide, may be regarded as independent of the degree of concentration.

The fact that the co-efficient of distribution is independent of the relative volume of the two solvents, may be readily explained in the following manner: Imagine the superposed liquids to be saturated with the substance: then for equilibrium to persist, it is only necessary that there should be equilibrium at the surface of contact of the two liquids, and this would be undisturbed by the addition of an arbitrary volume of the same liquid saturated to the same degree, to either of the superposed liquids. From the consideration of the influence of concentration, it is evident that as the solutions become more dilute, the co-efficient of distribution approaches a certain limit, so that if it is desired to remove a substance from a solution by agitating it with another liquid, it is advisable to employ the latter in successive fractions (*ib.* [4], xx, 422–425). Moreover, it is easy, by successive determinations of the co-efficients of distribution, to ascertain whether the substance dissolved is homogeneous or a mixture (*ib.* [4], xx, 425, 429 and 431). As there is a limit to the co-efficient as the solutions become more dilute, there will likewise be one as they become more concentrated, and it would naturally be supposed that this limit would be the ratio of the two liquids when saturated separately; but, experimentally, this has been found not to be the case, the co-efficient being less than that corresponding to the ratio of the solubilities. With respect to the relation between the co-efficient of distribution and the chemical composition of the substance dissolved, the authors find that ether removes more readily from their aqueous solutions: 1. The more highly carburetted of two homologous acids;

2. The monobasic rather than the corresponding bibasic acid (*e. g.*, butyric than succinic acid); 3. Or than the bibasic acid having nearly the same percentage composition (acetic acid and succinic acid); also (4) of acids containing the same carbon and hydrogen, that which has least oxygen (succinic and malic acids).

In the case of two substances in presence of two solvents, they are distributed as if each of the substances acted alone. This relation is analogous to the law of the solubility of mixed gases, and is capable of being applied to the separation of two mixed substances (*ib.* [4], xx, 425–431).—*Amer. Chemist, May*, 1873, from *J. Lond. Chem. Soc.*

PEPSIN.

By Charles Symes, Ph.D.

There are few medicines, perhaps, which have received so extensive a trial, and yet respecting which such differences of opinion exist, as pepsin. It cannot be doubted that this arises chiefly from the fact that it has not been recognized by the Pharmacopœia, and hence no standard tests of quality exist in this country. Chemists purchase the kind they think best, influenced perhaps by the advertisements of manufacturers or the report of some experimenter who may have used very carefully prepared samples, and not the commercial article; or it might be they are guided by price, the best qualities being usually attributed to the highest priced article of its kind, and this, indeed, should be a correct guide. But I have also heard of orders for pepsin in which the only condition stipulated for was its low price. It occasionally occurs that extremes meet, and my experience indicates that they are not so wide apart as would be supposed, even in this instance. It will not be surprising, however, under such circumstances, that pepsin might mean anything possessing more or less digestive power, an appearance varying from that of decorticated liquorice to pulv. doveri, and an odor from almost nil to the strong smell of bacon. Variable as it might be, it has stood the test of time, and at last asserted its right to recognition and admission to at least the outer circle, viz: to the Appendix. of the British Pharmacopœia.

For some time past I have been conducting a series of experiments on pepsin, first with a view of ascertaining the quality of commercial specimens by different makers; and secondly, of testing the various processes which have been proposed for its preparation as a medicinal

or restorative agent. My results under the first head somewhat surprised me, and might do others who have not made this subject one of experimental inquiry; one or two examples will perhaps serve as illustrations. It will be seen that I have used a minimum quantity of acid, so as to test the full peptic power of the various samples—the amount of acid often recommended in a given quantity of fluid being much larger than can possibly exist in the human stomach. In each instance, the white portion of hard-boiled eggs chopped in small pieces was used, and after digestion the undissolved portions, before weighing, were brought to as nearly as possible the same condition of dryness as they were in previously; 100 grains were introduced into each of six vials—to five of these ten drachms distilled water, ten minims dilute hydrochloric acid, and ten grains of pepsin of various kinds were added; in the sixth four drachms of the distilled water were replaced by the same quantity of pepsin wine, each drachm of which should have represented two-and-a-half grains of Pepsina Porci; all were digested under precisely the same conditions at a temperature of 100° for 12 hours. The following gives the amount by weight of undissolved albumen in each vial:—

No. 1	left	undissolved,	1½ gr.
" 2	"	"	2½ "
" 3	"	"	24 "
" 4	"	"	28 "
" 5	"	"	41 "
" 6	"	"	56 "

Now, the medical man who is desirous of testing the value of pepsin as a remedial agent, in one or more cases where he considers it ought to be of service, if there is any good in it, will be perfectly satisfied of its efficacy should Nos. 1 or 2 be dispensed, more or less so if No. 3; but what if No. 5? or if he should have prescribed pepsin wine, as No. 6? It might be said that this latter is largely prescribed, and also taken by invalids without prescription, frequently with good results. I can only reply that, according to the above statement, it possesses about one-half the peptic power that it should do, and that as the stomach is a laboratory whose operations are somewhat obscure even to the closest observer, in imitating its processes in a vial where we lack the vital agency, the activity of any samples operated on is almost sure to be underrated. Nevertheless, experiments conducted carefully under the same conditions are valuable as affording compara-

tive results; and certain is it that wine or any alcoholic fluid is a most unsatisfactory vehicle for pepsin, also, that, when taken with food, it unquestionably retards digestion. The above experiment was several times repeated, first with portions of precisely the same samples, and also with samples by the same makers, but obtained from different sources; the results varied slightly, but bore the same relation to each other. It was thought desirable not to obtain the samples from the manufacturers direct, informing them of the purpose for which they were required, but all were obtained from authentic sources. The pepsin Nos. 1 and 2 were both by the same manufacturer, and, as it will be seen, were of good quality, but it is somewhat anomalous that according to the dose given the former should have been about five times the strength of the latter, whereas it would appear that there is little difference between them. The catalytic action seems to be much more vigorous in the early part of the process of digestion than towards the end; therefore, had a larger amount of albumen been present in the vial No. 1, it is possible a larger amount might have been dissolved, and the residue have been but slightly greater than it actually was. Nevertheless, this could not have been sufficient to account for the great similarity in activity of the two specimens.

Of the processes for its preparation as a medicinal agent, that of precipitating its solution by acetate of lead, and subsequent separation of the lead by hydrosulphuric acid, has probably been longest in use, but its activity appears to be more or less injured by the chemical treatment. The process of M. Brucke, consisting of solution in dilute phosphoric acid, neutralization with lime-water, re-solution in dilute hydrochloric acid, and final treatment with cholesterin, rectified spirit, and ether, yields a product possessing active peptic properties, but is more suitable as a laboratory experiment than for the purpose of manufacture on a commercial scale. Tannin and alcohol have both been proposed as precipitants for pepsin, but I am not aware of any definite process in which these are used for its preparation on a large scale. Next in order is the somewhat primitive process of Dr. Beale. It is given in the *Pharmaceutical Journal*, N. S., Vol. II, p. 684, and is as follows:—

"The mucous membrane of a perfectly fresh pig's stomach was carefully dissected from the muscular coat, and placed on a flat board. It was then lightly cleansed with a sponge and a little water, and much of the mucus, remains of food, etc., carefully removed. With

the back of a knife or ivory paper knife, the surface was scraped very hard in order that the glands might be squeezed, and their contents pressed out. The viscid mucus thus obtained contains the pure gastric juice, with much epithelium from the glands and surface of the mucous membrane. It is to be spread out on a piece of glass, so as to form a very thin layer, which is to be dried at a temperature of 100° over hot water or *in vacuo* over sulphuric acid. Care must be taken that the temperature does not rise much above 100°, because the action of the solvent would be completely destroyed. When dry, the mucus is scraped from the glass, powdered in a mortar, and transferred to a well-stoppered bottle."

Several persons who have performed experiments with this (so called) pure digestive powder, including Dr. Beale himself, have spoken highly of its peptic properties; and from their position we cannot doubt the accuracy of their experiments and statements. In my own hands, however, I cannot say the results were so satisfactory as I had anticipated. The process, too, if carried out strictly according to Dr. Beale's instructions, is a very wasteful one, more pepsin being lost than is obtained; if, on the other hand, it is attempted to obtain a larger quantity, the quality is reduced. The mucus which is directed to be sponged off, and which is usually considerable in quantity, possesses about one-third to one-half the activity of the mucus which is afterwards directed to be *scraped* off; then, after this scraping, a considerable amount of pepsin remains, which can be demonstrated by dissolving it out.

Lastly, we have the process of Mr. E. Scheffer, the most satisfactory as regards uniformity of excellence and economy in working of any I have tried. It has been detailed in this Journal so recently* I need not therefore even recapitulate here. It can be made to answer strictly to the tests given; it keeps well; is soluble in an acidulated fluid, and hence might be prescribed in solution of almost any strength. Amongst other experiments one was performed in which a given quantity of the moist mucus scraped from fresh, cleansed pigs' stomachs, was divided into equal portions, one of which was retained moist, another dried in a thin layer at a temperature not exceeding 100°; from a third portion the pure pepsin was separated by Mr. Scheffer's process, but adding sufficient sugar of milk to bring it to the exact weight of the portion simply dried.

*See American Journal of Pharmacy, Feb. 1872.

Into each of four vials 100 grains of coagulated albumen, 10 drops dilute hydrochloric acid, and 10 drachms of water were placed; to the first 10 grains of the dried mucus, to the second 80 grains of the moist (it requires this quantity to produce 10 grains of the dry), to the third 10 grains of the purified saccharated, to the fourth 10 grains of the same, and two drachms of the water were replaced by sherry wine. After twelve hours' digestion, at a temperature of 100°, the results were as follows:

No. 1	left	undissolved	31 grs.
" 2	"	"	22 "
" 3	"	"	12 "
" 4	"	"	52 "

From this we learn that undried mucus is more active than the same substance after drying; that the pure pepsin diffused through sugar of milk is more active than the mucus from which it is obtained; and finally, prove the truth of the statement before made, that wine partially destroys the activity of pepsin and is an unsuitable vehicle for its administration.

I propose, therefore, to substitute for pepsin wine an *elixir*, made by dissolving the purified moist pepsin in raspberry vinegar, so that one fluid drachm shall be capable of dissolving 100 grains of coagulated albumen. This keeps well, and is perfectly palatable.—*Pharm. Journ.*, (*London*), *July* 2, 1873.

ON BUTTER.*

By J. Campbell Brown, D. Sc. (Lond.) F. C. S.,

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Definition of Butter.—Pure butter is a fat which has passed through the udder of a cow or other animal as one of the constituents of milk, and which has not been decomposed, by keeping or otherwise, into fatty acids or glycerin.

In milk and cream, the fat is all contained in minute round globules, and butter appears, under the microscope, full of these globules. Chemically, it consists of a mixture of neutral fats, the glycerides of the non-volatile acids, palmitinic acid ($C_{16}H_{32}O_2$), and butyroleic acid ($C_{12}H_{30}O_2$); and the glycerides of the volatile acids, butyric acid (C_4

*From the "Liverpool and Manchester Medical and Surgical Reports, 1873." Communicated by the Author.

H_8O_2). capronic acid ($C_6H_{12}O_2$), caprylic acid ($C_8H_{16}O_2$), and caprinic acid ($C_{10}H_{20}O_2$). (Wagner and Crookes.) The last four glycerides are the characteristic fats of butter.

When butter has been decomposed, the rancid taste and smell make its condition evident to every one. The skill of the analyst is most frequently directed to the detection of fats from the flesh of animals or from the vegetable kingdom. The fats which are generally used as adulterants or as substitutes for butter are suet, tallow, dripping, lard, a mixture of refined fats sold under various names, palm and similar vegetable oils. The most characteristic ingredients in these fats are stearin, margarin and palmitin.

Stearin is a crystalline fat, melting at 144° F., and solidifying at 124° F., soluble in hot ether, or in seven times its weight of boiling alcohol, but deposited from both these solutions on cooling.

Margarin forms scales, which melt at about 116° F., and are soluble in warm ether.

Palmitin is a solid crystalline fat, melting at from 113° to 143°, and solidifying at 114°. It is readily soluble in ether, sparingly soluble in alcohol. Stearin, margarin, and palmitin are seldom obtained pure; they occur in Nature dissolved in olein and other oils, which lower the melting-point. For instance, mutton and beef suet, lard and palm oil melt at temperatures from 25° to 55° below the melting-points of stearin and palmitin.

In drawing up the following table for the examination of butter, I have made free use of the observations of Dr. Ballard (*Chemical News*, vols. iv and v), and the scheme of Dr. Parkes ("*Hygiene*," chap. v, section xi); but I depend chiefly on my own observations on a large number of samples from different sources, made during the years 1871 and 1872.

Table for the Examination of Butter.

1. Weigh out an ounce of the sample of butter which is to be examined, place it in a test-tube seven-eighths of an inch in diameter, and melt by placing the tube in hot water. Place a thermometer, with a pear-shaped bulb, so that the bulb shall be in the middle of the fat about one inch below the surface, and allow the whole to cool spontaneously. If the quantity of water in the butter be large, it will collect in the tube below the fat; the casein will also collect in the lower part of the tube. Watch the mass as it cools, and note when solidification commences and when it is complete. The following are the average solidification-points:—

With pure butter the thermometer is obscured between 74° and 68°, and the mass is solid at 60°.

Beef dripping obscures the thermometer at 79°, and is solid at 72°.

Mutton dripping obscures the thermometer at about 85°, and is solid at 84°.

Lard obscures the thermometer at 84°, and is solid at from 79° to 70°, but it often remains as soft as butter at a much lower temperature.

Mixtures solidify at intermediate temperatures.

2. Determine the quality of the butter by the taste and smell of the re-congealed fat and of the original sample.

3. Examine several portions of the original sample by means of a good microscope, using a one-quarter inch or one-fifth inch object glass. In butter made from milk or cream, nothing is seen except the characteristic globules, and the granular masses of curd, and the cubical crystals of salt. The hard fats of butter are present in the globules in a state of solution, and are not recognizable in a separate form.

If stearic acid, stearin or palmitin be present in separate form, they will be recognized by single fusiform crystals, or star-like aggregations of acicular crystals. They indicate the presence of melted fats.

Other substances, such as starch, flour, palm oil corpuscles, Irish moss, coloring matter, etc., may also be distinguished by the microscope, as distinct from butter or fats.

4. Examine the same portions with the same object-glass, together with a polariscope, consisting of two Nicol's prisms and a selenite plate. The crystals referred to in (3) polarized light, and when viewed by the polariscope are more distinctly defined. Particles of suet and other fats, which have not been melted, may also be distinguished by their action on polarized light, by their amorphous form, and by their membranes.

5. Repeat the microscopic examination after the addition of tincture of iodine, acetic acid, and other reagents usually employed to detect substances other than fat.

6. Weigh carefully a convenient quantity of the sample, say 1 oz., in a tared porcelain dish, evaporate in a water-bath, or in air-bath, at 212°, until free from water, and weigh again; the difference is the amount of water per ounce, which should not exceed 35 grs. (5 to 10 per cent. Parkes).

7. Dissolve the residue in ether, warming gently until the whole of the fat is dissolved, filter through a weighed filter-paper, collecting the filtrate in a beaker, then wash the dish and filter-paper with ether until a total of 5 or 6 oz. has been used, and allow the whole to stand for some time at a temperature of 65°.

8. Dry the precipitate on the filter-paper, and weigh; deduct the weight of filter-paper; the remainder is approximately the amount of curd, or casein, and salt.

9. Wash the precipitate with boiling water, dry at 212°, and weigh; deduct the weight of filter-paper; the remainder is the amount of curd or casein, which, in good butter, should not exceed 15 grs. per oz. (3 to 5 per cent.; Parkes).

10. Estimate the salt, by means of nitrate of silver, in the aqueous washings from (9), or wash another weighed portion of butter thoroughly with distilled water, and determine the salt by nitrate of silver. It should not amount to more than 8 grs. per oz. in fresh butter (0.5 to 2 per cent.; Parkes), or 35 grs. per oz. in salt butter (8 per cent.; Parkes.)

11. If the ethereal solution of the fat from (7) has formed a deposit at 65°, decant and filter off the clear solution, and examine the deposit, which is probably stearin, according to (12).

Evaporate the ethereal solution down to 4 oz., and allow it to stand for several hours at 65°. Filter off the deposit, which probably still contains stearin, and examine it also according to (12).

Allow the ethereal solution to evaporate down to 3 oz., and allow it to stand for some time at 65°. Filter off the deposit, which may still contain some stearin mixed with palmitin, and examine it separately according to (12). If the butter is adulterated, some of the stearin, and much of the palmitin, will still remain in solution, and may be obtained by continuing the process of spontaneous evaporation.

Some samples of pure butter yield no deposit from 3 oz. of ether at 65°; but fairly good butter will generally form a slight deposit, the amount of which varies in different samples. A sample of butter known to be pure should be examined side by side with the sample suspected to be adulterated; and, as winter butter is a more solid fat than summer butter, the former should be chosen for the comparative experiment.

12 (*a*). Place each of the above-mentioned deposits in a thin weighed

glass tube, and after evaporating off the ether, weigh the fat and determine its melting-point; melt carefully, and allow it to cool gradually. Place a small accurately graduated thermometer with pear-shaped bulb in the melted fat, and observe the temperature at which the latter begins to solidify. When quite solid, re-warm the tube gradually, by placing it in water, the temperature of which is slowly raised, and observe the re-melting-point of the fat.

(*b*). Or, melt the fats in a thin glass or porcelain dish, floated in water, the temperature of which is slowly raised, a thermometer being placed in the water. In this case the apparent melting-point will be 2° or 3° above the correct figure, but the relative differences between the melting points of the several deposits will be the same as in (12*a*).

13. Determine the taste and smell of each of the deposits.

44. The number of grs. per oz. may be reduced to parts per cent. by multiplying by the factor 0·22857.—*Chem. News, July* 4, 1878.

ADULTERATION OF PEPPER.*

By M. Bouchardat.

During the examination of a large number of specimens of ground pepper the author met with various inert powders, and among those which he detected the most often was one prepared by drying and finely pulverizing the parenchyma of potatoes which is left as a residue in the manufacture of starch. Pepper mixed with this adulterant has a more feeble odor; its taste is at first sweetish, and afterwards pungent, but less intensely so than in normal pepper. The mixed powder is uniformly grey, whilst the powder of pepper presents some blackish particles and some of a yellowish-grey color. Comparison should therefore be made between a suspected powder and one prepared by grinding pepper to the same degree of fineness. Ground pepper mixed with this potato powder floats longer on the surface of water than that which is pure, and the coloration of the water is different. Liquor iodi, added drop by drop, gives a more intense blue with the potato mixture than with normal pepper. Too much importance, however, must not be attached to this test, as M. Léon Soubeiran has shown that pepper contains a considerable quantity of a peculiar fecula.

The other substances found mixed with ground pepper were: (1)

* L'Union Pharmaceutique, vol. xiv, p. 145.

lentil flour mixed with earth, which can be detected by the microscope and calcination; (2) chalk; and (3) linseed cake, ground to a degree of fineness comparable to that of ground pepper. By the aid of a good glass the fragments of linseed could easily be seen. In some specimens seized at the custom-house the powder of sesame seeds was detected; and it appeared probable that in this case, in order to obtain the proper shade for the powder, the adulterator, who had sent from Marseilles several hundred bags of this product, had mixed many sorts of seeds.

White pepper, obtained, as is known, by the decortication of black pepper, is often adulterated with talc, chalk and starch in considerable proportions. The introduction of these three inert matters may have for its object either the direct increase of bulk or the masking of an imperfect decortication. After the examination of numerous specimens, M. Bouchardat came to the conclusion that many manufacturers supply two products: one, known as *poivre léger*, consisting principally of the cortical part of the pepper, black fragments forming the greater portion of it; the other, known as *poivre blanc*, being mixed with talc or starch, to imitate the shade of white pepper. Although the *poivre léger* contains nothing foreign to pepper, yet, as the useful part is eliminated, the sale of such an article must be looked upon as a fraud upon the part of the dealer. It is also sometimes adulterated with ground grains of paradise, which is easily detected by means of a magnifying glass. In France, to avoid prosecution, the wholesale dealer is said often to sell the ground pepper pure and the mixture intended for its adulteration separately.

The usual adulterants of pepper may be clearly identified by means of a microscopic examination, with an instrument of 300 to 400 magnifying power, in the hands of a skilled person. The powder of pepper is characterized principally by its starch. This appears in compound grains retaining the form of the cells in which they were contained, and which they entirely filled. They are of variable forms and dimensions; M. Mussat has measured them from 0·030 mm. to 0·20 mm. in diameter. The simple grains of which they are formed are, from their juxtaposition, irregularly rounded, and are from 0·001 mm. to 0·0056 mm. in diameter. Under the action of iodine they assume a rather dull violet-blue color. Solution of caustic potash attacks them but slowly. This fecula is accompanied by the *débris* of the pericarp, which presents two very distinct forms of cells. In

one case they are nearly cubical, with rather thin walls, containing a blackish granular matter, which is the fleshy portion of the pericarp; in the other, the cells forming the endocarp, they are cuneiform, often slightly curved, and their very thick walls are canaliculate. The author found their mean size to be 0·025 mm. wide by 0·062 mm. long. Potato starch is easily distinguished from that of pepper by its simple, more or less rounded or ovoid or irregularly trigonal, strongly refractive grains. The largest measure 0·180 mm. All, except the smallest (which measure about 0·010 mm.), have a conspicuous, often stellate hilum, and their concentric zones are clearly visible. Dilute solution of caustic potash attacks them very rapidly. A yellow tissue contained in several of the specimens examined was distinguished easily by its elongated polygonal cells, with thin, clear, yellow walls, enclosing a slightly darker granular substance. It probably belonged to some oleaginous cruciferous seed, or to linseed.

In consideration of the great skill with which pepper is now adulterated, M. Bouchardat recommends that dealers should, as far as possible, buy their pepper whole and grind it themselves.—*Pharm. Jour.* (*Lond.*), *June* 14, 1873.

BROMIDE OF ZINC.

Richmond, June 20th, 1873.

Mr. Editor.—I desire to call the attention of your readers to the *Bromide of Zinc* as a substance promising to be of value as a therapeutic agent, and to ask a trial of it in suitable cases, in order that its true value, if any, may be determined.

I was led some weeks ago, by theoretical considerations, to conclude that this would probably prove a useful combination, and I therefore requested Mr. J. N. Willis, corner 4th and Franklin streets, to undertake the preparation of it, in order that it might be duly submitted to trial. I was led to this conclusion by the belief that the sedative and nervine properties of the bromides, and the tonic and antispasmodic properties of the preparations of zinc, would harmonize very well together, and by the knowledge that the two classes of preparations are very much employed in the same category of diseases, viz.: epilepsy, chorea, whooping cough and other spasmodic and nervous affections. In epilepsy, for instance, Hammond and other writers recommend the bromide of potassium or sodium and the oxide of zinc, given at the same sime, the one in solution, the other in pill.

Now, why should not the bromine and the zinc be *combined in one and the same compound*, so as to obtain the same object (perhaps) by one prescription which has hitherto been sought by two? We have the bromide of iron, the iodide of iron, the iodide of zinc:—then why not the *bromide of zinc?*

Such were the considerations which led me to propose the bromide of zinc as probably (or possibly) a useful preparation. Mr. Willis accordingly prepared some by a process similar to that pursued in the preparation of the other articles above mentioned, viz., by direct combination of the elements; and the resulting compound being deliquescent, and apparently not very permanent in composition, it was deemed best to protect it from change by means of sugar or some other agent. Mr. Willis therefore prepared a *syrup of the bromide of zinc*, analogous to the syrups of the iodide and bromide of iron, and of the strength of one drachm of the bromide to the fluid-ounce of syrup, or 7½ grains to the fluidrachm. Supposing that glycerin would answer still better the object of protecting the compound from change, he also prepared a *glycerole*, of the same strength.

After these preparations had been made, I was informed that the bromide of zinc was enumerated in a recent price-list of a New York manufacturing druggist; but on a careful examination of the most recent works on materia medica and therapeutics accessible to me, as well as of the files of five different medical journals, I find no mention of it; I am therefore justified in inferring that it is at least not generally known to the profession.

Theory would indicate that this compound would (or might) prove useful in various diseases in which a *tonic and antispasmodic* remedy is required, viz.: epilepsy, chorea, hysteria, neuralgia, debility with nervous irritability, sleeplessness, etc. I regret, however, that I am as yet unable to furnish any clinical proof of its therapeutic value from my own experience, no case having recently presented itself which I thought suitable for a trial of it. I may refer, however, to a case recently under treatment in the hospital of the Medical College, in which it was used with apparent benefit. The patient was an adult female laboring under hysteria, with singular involuntary movements, not identical with those of chorea, but probably akin to them in nature, for which she had been subjected to various treatment without success. Dr. Taliaferro, the resident physician, with the approval of Prof. McGuire, who was directing the treatment of the case,

determined to make trial of the bromide of zinc, and accordingly gave the patient 15 drops of the *glycerole*, properly diluted, three times a day—which dose was afterwards increased to 20 drops. After a few days' use of the remedy, the patient returned to her home in the country, where she continued to take it, and I learned at second hand from her physician there, that her condition is very much improved. Whether, and to what extent, the dose may have been increased, I am not informed. Of course, we can only determine by repeated and cautious trials what dose can be safely tolerated, and what quantity must be given to ensure its favorable therapeutic action. To obviate any possible irritating effect upon the alimentary canal, the medicine ought to be given in a sufficient quantity of water, to which, if desirable, mucilage and aromatics might be added.

If any of your readers should decide to make trial of the remedy here suggested (which can now be obtained of several of our apothecaries), I hope the results, whether good or bad, will be duly communicated for the general information. Yours very truly,

L. S. Joynes, M.D.

—*Virginia Clinical Record, July*, 1873.

THE DIRECT SYNTHESIS OF AMMONIA.*

By W. F. Donkin.

The action of induced electricity on mixtures of certain gases has been lately shown by Sir Benjamin Brodie† to yield very interesting results.

An obvious application of his method was to treat a mixture of dry hydrogen and nitrogen in a similar manner as those referred to above, with the view of effecting the synthesis of ammonia; and Sir B. Brodie kindly allowed me the use of his apparatus for the purpose of the experiment, which was conducted as follows:

A mixture of about three volumes of hydrogen with one of nitrogen in a bell-jar over water, was passed through two tubes containing pumice moistened with alkaline pyrogallate and sulphuric acid respectively, then through a Siemens induction-tube, and into a bulb containing dilute hydrochloric acid. The whole apparatus being first

* Read before the Royal Society, May 1, 1873 (Proceedings, vol. xxi, p. 281).

† Proceedings of Royal Society, April 3, 1873, and *Pharm. Journ.*, 3d series, vol. iii, pp. 136, 156.

filled with pure hydrogen, about half a litre of the mixed gases was sent through the apparatus, the induction-coil not being in action; the bulb containing the acid was then removed and another substituted, containing an equal volume of the same acid.

About half a litre of the mixed gases was now passed through the apparatus, submitting them to the action of the electricity. The contents of the two bulbs were next transferred to two test-tubes; and after adding excess of potash to each, Nessler's test was applied. The first solution gave a faint yellow coloration, the second a rather thick reddish-brown precipitate.

No attempt was made to estimate the quantity of ammonia formed, as it would vary with many of the conditions of the experiment.

Since writing the account of the above experiment, which was made in Dr. Odling's laboratory at Oxford on March 24, I have seen in the "Comptes Rendus" for April 22, 1873, a note of an experiment by Messrs. Thénard of Paris, in which they observe the formation of traces of ammonia by the action of electricity on a mixture of hydrogen and nitrogen; but no details of the mode of operating are given. —*Pharm. Journ. and Trans.*, London, June 21, 1873.

THE PREPARATION OF GELATIN.

In the ordinary manner of making light-colored gelatin, thin skins, sinews, cartilages and bones are employed, which must be treated with muriatic acid and lime before being dissolved. These have furnished a good article, but at a high price. The expense of this process therefore induced F. Henze, of Berlin, to thoroughly investigate the subject of its manufacture in the hope of producing an equally good article at a lower price. The material employed was the brown, or almost black, glue of very poor quality, which is a by-product in a Berlin neatsfoot oil manufactory, and which sells for five dollars per hundred weight. This substance does not swell up in cold water like glue, but forms a gummy mass, dissolving as a thick, syrupy liquid, not very adhesive, but resembling that of which printers' rollers are made. It is now used only in making cardboard and as a dressing for very dark-colored fabrics.

In preparing this glue, the feet are first freed from hoofs and the more solid bones of the leg, which are used for turning into buttons and ornaments, and washed. They are then exposed for three hours

to the action of superheated steam under a pressure of two atmospheres in a closed vessel; and after standing quietly half an hour, the liquid is drawn off. After skimming off the supernatant grease, the strong ammoniacal glue solution is strained and evaporated on a steam bath, and then furnishes the before mentioned blackish glue. When perfectly dry, it is very brittle and easily rubbed off between the fingers. Attempts to bleach it have yielded unfavorable results. It shows that it is already decomposed and is no longer gluten, or contains only very little of it. A large quantity of sulphurous acid partially bleaches it, but to employ this on a large scale would involve many technical difficulties. The fragile apparatus for making sulphurous acid would soon be broken in the hands of the workmen. Sulphite of soda could be dissolved in a very dilute glue solution, and muriatic acid added to decompose this salt, if the quantity of the sulphite of soda required were not too large; but fifty kilogrammes of glue would require at least 2,500 grammes sulphite of soda and 2,250 grammes muriatic acid. The salts formed, which are sulphate of soda and chloride of sodium, as also the free acid, would in no case increase the quality of glue, but on the contrary would render it utterly useless for many purposes in the arts. The process of bleaching with mineral acids would also destroy the iron evaporating pans, so that this method must be given up entirely.

All attempts at giving to the glue, when finished, the color desired having failed, no other course remained but to ascertain the cause of its becoming so dark-colored. The presence of sulphur and of considerable quantities of ammoniacal salts in the glue solution was too striking to escape notice very long. They could only have been caused by allowing the steam to act too long and too violently, whereby not only were the cartilages and gristle converted into glue, but the hair too had been dissolved, and thus caused the dark color. In order to reduce the decomposition of the glue and formation of ammonia to a minimum, the process may be varied in such a manner that, instead of drawing off the contents of the digester once at the end of three hours, they shall be drawn off hourly. On standing a little, the grease rises to the top and can be skimmed off, and then a quantity of fresh wood charcoal mixed with 25 per cent. bone black is put into the liquid and left over night for the purpose of absorbing ammonia and other impurities. The following morning it is heated to a temperature at which gelatin melts, about 70° to 85° Fahr., strained and

evaporated to the desired consistency. The amount of charcoal necessary is about four per cent. of the quantity of glue in solution. The odor given off by evaporation after it has been purified with charcoal is quite pleasant and resembles that of *bouillon* soup, while that given off by the former method is one of the most disagreeable smells that ever polluted the atmosphere.

Glue prepared in this way answers all the requirements of a first class article. Even in thick layers the color is a pale wine yellow, and it possesses a high degree of elasticity. It has neither smell nor taste; and being always prepared from fresh material, it can be employed for all the purposes of so-called gelatin.—*Scientific American, from Dingler's Polytechn. Journ.*

POISONING BY WILD PARSNEP—[*SIUM LATIFOLIUM* OF GRAY].

By C. B. White, M. D., U. S. A.

On April 24th, 1873, I was called, after dark, to assist E. C., a native of Belgium, aged forty nine years, nearly twenty-one years a resident of California, who was suffering from the effects of eating less than one ounce (estimated) of the fresh root of the wild parsnep.

Evidently not familiar with either this plant or with the taboose (a highly nutritious and harmless tuber, largely used by our Indians as food), he had taken and eaten some of the root of the former, probably mistaking it for the latter, about two hours and a half before I saw him. On my arrival, I found that he had received partial relief from vomiting and purging, apparently induced by the root itself, but I found him much excited and very prostrate in strength; pulse 44, skin cold and clammy, pupils somewhat dilated, respiration slow. He complained of great dizziness, lack of mental power, and loss of voluntary motion, headache, sense of fear of death, with a decided burning feeling along the alimentary tract (æsophagus especially), and sense of swelling and flatness about the bowels. I examined the excreta and became satisfied that most of the root had been ejected, and at once gave him two ounces of whiskey, mixed up with a raw egg. After this had revived him, I administered morphiæ sulphas gr. ¼, and left a compound ipecac powder for later use.

Before I left him he was feeling much better in every way, the skin was warmer, the pulse 50, the respiration and appearance of the eyes nearly normal.

I visited him the next day and found that he had passed a good night, but was very weak still and had no appetite; he complained also of a sense of soreness and loss of power in his limbs, notably in the arms. A mild tonic restored him.

In treating him, I was forcibly reminded of the action of Veratrum viride, as I have used it in hospital practice. I believe the toxic properties of the wild parsnep to closely resemble those of the American hellebore.

The wild parsnep is very common in the swamps and along the water-courses of this valley (and I believe it to be not uncommon all over the Pacific coast); in Spring-time it casts off tubers, apparently to propagate itself, and before grass starts in the Spring it is frequently eaten by cattle, causing speedy death.

When the shoots have grown up, cattle and horses eat them with apparent impunity, and the mixing of them with grass cut as hay seems to have no injurious result; but the root seems to have decided poisonous properties at all times. I saw a fine cow die about September 1st, last, from eating it.

In appearance, mode of growth, odor and taste it resembles its innocuous congener, except that its tubers are usually shorter and rounder, and that it has a latent pungent flavor. In my opinion, it would be well to spread a knowledge of its dangerous properties, so as to have new-comers made aware of them.

Camp Independence, Owen's Valley, Cal., May 1st, 1873.

—*Pacific Med. and Surg. Journ.*, June, 1873.

ESSENCE OF ALAN-GILAN (YLANG-YLANG). *UNONA ODORATISSIMA.*

By H. Gal.

In a paper presented to the French Academy the author has recorded the results of an investigation of the principal properties of the essence which for the last few years has been known in commerce as Ylang-ylang or Alan-gilan. It is a product obtained by distillation from the flower of the *Unona odoratissima*, an anonaceous tree growing in the Antilles and Jamaica.

The essence has a density of 0·980, at a temperature of 15° C. A column five centimetres long rotates a beam of polarized light 14°

to the left. It passes over entirely in distillation without leaving any carbonaceous residue, but within very extended limits of temperature, ebullition commencing at about 160° C., and the temperature continuing to rise till beyond 300° C.

The essence is insoluble in water, but entirely soluble in ether; alcohol only partially dissolves it. The insoluble portion taken up in ether appears after the evaporation of that solvent as a semi-fluid, transparent mass. About one-fourth of the essence yields this product.

Nitric acid attacks ylang-ylang with great energy, intense vapors being disengaged in the cold, and by the addition of water a resin is obtained presenting a great analogy with that which is formed by oxidation of benzoin by means of the same reagent. Bisulphite of sodium is without action upon this essence. Potash, on the contrary, when sufficiently concentrated and used at a suitable temperature, gives rise to a kind of saponification. If the alkaline portion be removed, and a fresh quantity of potash added, and the treatment be repeated until the essence is no longer attacked, a substance is left which is insoluble in water. The aqueous portion, upon the addition of hydrochloric acid, deposits a solid body having a crystalline aspect. This dissolves with facility in boiling water; the solution, being filtered to separate a small quantity of resinous matter, yields upon cooling white pearly plates. This body melts at about 120° C., it volatilizes very readily, and is deposited upon the cool sides of the vessel in shining needles, and boils regularly at about 245° C. These are the physical properties of benzoic acid, and this substance has also its chemical properties. In fact if a small quantity be heated in presence of an excess of lime, an oil is separated which is insoluble in water, and possesses the odor and properties of benzole. Treated with perchloride of phosphorus, an energetic reaction takes place, and the piquant and characteristic odor of chloride of benzole becomes manifest. A few drops of this latter body with alcohol yielded benzoic ether. For greater certainty M. Gal submitted some of this acid to analysis. 0·276 of matter, ignited by means of oxide of copper, gave 0·126 of water and 0·696 of carbonic acid.

	Found.	Calculated.
C	68·7	68·8
H	5·0	4·9

It is, therefore, quite evident that the acid abstracted from the essence by saponification is none other than benzoic acid. The author believes this to be the first essence which has yielded a like result, that compound having been, hitherto, only met with in balsams.

The part insoluble in potash was distilled with water, and then separated from the water which passed over with it into the receiver. After drying over chloride of calcium, this oil distilled at from 170° C. to 300° C., very nearly as the natural essence. With so great a range of temperature, it was useless to expect to separate from this matter definite products with a constant boiling point; M. Gal, therefore, attempted to ascertain the nature of these bodies, which might be supposed to consist of carbides of hydrogen analogous to those so often met with in essences.

The product was treated with anhydrous phosphoric acid; a vigorous reaction took place, and a liquid was collected which no longer possessed the odor of the essence. Iodide of phosphorus also reacted upon it with great energy, and a liquid was distilled more dense than water, and possessing a piquant odor. These reactions showed that it was an oxygenated substance—or rather a mixture of oxygenated substances—resembling the alcohols in chemical properties.

M. Gal considers it probable that the acid referred to may be considered as forming in the essence benzoic ethers with these alcohols. On the one hand, the acid does not exist in the essence in a free state; and on the other hand, he was unable to obtain any alcohol soluble in water by distillation of the essence in the presence of potash.—*Lond. Pharm. Journ.*, July 12, from *Comptes Rendus*, June 16, 1873.

Varieties.

Domestic Pepsin —Messrs. Editors.—I see, in the Journal of May 22,* an article on pepsin, by Dr. Hoskins, of Lowell. I think his remarks will do good.

I am using what I call *domestic* pepsin, consisting of the inside of the gizzards of chickens, turkeys, ducks or geese, or the stomachs of calves or little pigs. Dry them on a stove in a plate, and then bruise them, and give a third of a teaspoonful of the powder in syrup a few minutes before eating. Some country people dry the gizzard itself and then grate it, and give that powder in the same way for dyspepsia.

*See American Journal of Pharmacy, July, p. 322.

I think this crude, inelegant *domestic* pepsin far superior to pepsin made from *macerated* pigs' stomachs, and it costs the poor patient next to nothing. I direct the patient to obtain and dry these skins and bruise them.

Portsmouth, N. H. N. L. Folsom, M. D.

—*Boston Med. and Surg. Jour., June* 5, 1873.

Oysters and their Peculiar Digestive Property.—Messrs. Editors.—Recently, you had a paper from me about pepsin. While trying experiments with it, I was one day requested by one of our most experienced physicians to digest two oysters. I placed them, after thorough washing, with one grain of Scheffer's pepsin, four drops hydrochloric acid, and one ounce of water, in a test tube, and submitted to a temperature of 100° Fah. At the expiration of two hours, almost perfect solution had taken place, only four and a half grains remaining on the filter, and the residue was of a feculent character.

Thinking over this result, and the matter of eating raw oysters, I came to the conclusion that here we have an organized being, with a stomach, etc., calculated to digest infusoria—as its food—and hence possessing a gastric juice; and if so, what should hinder that gastric juice from digesting even the oyster itself, if submitted to the proper condition.

With oysters, as bought by the quart, there is so much liquor. On boiling a little of this liquor it coagulated, indicating so much coagulable albumen. I took another portion of two drachms of this liquor, one drop of hydrochloric acid, and submitted to 100° Fah. for two hours. It remained perfectly clear, and, on boiling a half of it, there was no coagulation, and, applying Fehling's test, there was the beautiful purple color produced, the whole indicating that there was in the liquor a natural element to produce the result. This experiment I have tried repeatedly; and, to make the matter still more conclusive, I placed one ounce of the filtered liquor in a flask, added to it 120 grains of thoroughly washed and wiped, solid part of an oyster, and five drops hydrochloric acid, and submitted to 100° Fah. for seven hours. On filtering, I had only seventeen grains of solid matter left, thus showing that 103 grains of the solid oyster had been digested in one ounce of the liquor.

These facts are, I think, extremely interesting, and though my medical brethren have, with me, ordered patients, on recovering from exhausting disease, oysters as a part of the diet, and many have done it empirically, it has, after all, been done under strictly chemico-physiological principles, without our knowing it.

Very truly yours,

Lowell, May, 1873. E. H. Hoskins.

—*Ibid.*

On Dextrin—M. Musculus.—The author has transformed glucose into dextrin by a modification of the ordinary process of etherification. Glucose, previously dissolved in its water of crystallization and cooled, was dissolved in concentrated sulphuric acid. Then, in place of heating, he added alcohol of 95 per cent. When all was dissolved, he filtered the solution, and set it aside in a cool place in a well stoppered flask. A light precipitate appeared on the next day, and continued forming for about three weeks. This precipitate, on

being separated, washed and dried, differed from starch dextrin only in its rotatory power, which, although nearly double that of glucose, is still below that of the natural product.—*Amer. Chem., May, from Bull. de la Soc. Chim.*

Detection of Adulteration in Coffee.—J. Müller.—In order to ascertain whether ground coffee has been mixed with either roasted corn or amylaceous substances generally, it is only necessary to treat the powder, first with dilute caustic potassa, and, after filtration and addition of a large quantity of pure water, a solution of iodine is added, whereby the starch is detected.—*Chem. News, May* 30, *from Dingl. Polyt. Journ.*

Estimation of Acid in Fatty Oils.—M. Burstyn.—The oils are well mixed with twice their bulk of strong alcohol, 90 per cent. at the least; this dissolves the acids which may be present in the oils, while hardly any of the latter are taken up. The alcoholic solution can be readily neutralized with a caustic soda solution of known strength. It is best to take 100 c. c. of the oil to be tested, to which an equal bulk of alcohol is added, care being taken to mix the fluids thoroughly. After some time the alcohol floats on the oil, and 20 c.c. of the former fluid should then be taken for titration. 100 c.c. of good machinery oil should not require more than from 0·04 to 1·4 c.c. of normal caustic soda solution for neutralization.—*Ibid.*

Distribution of Potassa and Soda in Plants.—E. Peligot.—The author has endeavored to determine whether a plant, watered during the entire period of its growth with water holding in solution common salt and nitrate of soda, absorbs a certain quantity of soda; and whether it takes from the soil other elements from plants of the same species cultivated under identical circumstances, but watered—some with common water and others with potassic and magnesian solutions? The tabulated observations show that the common salt, and the nitrate of soda have been totally left by the plants; none of the ashes contained soda. Nitrate of soda acts only in consequence of the acid it contains which probably combines by double decomposition with potassa or lime.—*Ibid., May* 23, *from Compt. rend.*

The Dose of Carbolic Acid.—Dr. W. G. Cotton, East Bethlehem, Washington Co., Pa.—The following case is of interest, as showing that we may yet be unacquainted with what should be the proper dose of carbolic acid in some instances. Mrs. Moffitt, aged 70, was suffering from diarrhœa, for the relief of which she requested her husband to pour out twenty-four drops of laudanum. He by mistake gave her that amount of crude carbolic acid. It "burnt" the mucous membrane of the mouth and throat considerably, and produced a moderate amount of nervous prostration, which did not last long. She at once was aware there had been a mistake made, but thought the drug taken was "pain-killer." In about an hour afterwards the discovery was made that carbolic acid had been taken, and milk was then freely used as an antidote. The evil which resulted was immediate, but immaterial, and the good accomplished was the

relief of the diarrhœa. I would not recommend twenty-four drops as a proper dose of this fluid, but have an idea that one drop is rather homœopathic.—*Med. Times, June* 21, 1873.

Minutes of the Philadelphia College of Pharmacy.

A stated meeting of the Philadelphia College of Pharmacy was held June 30th. 24 members present. Wm. Procter, Jr., Vice-Presieent, in the chair.

The minutes of the annual meeting were read and adopted. The minutes of the Board of Trustees were also read for information by Wm. C. Bakes, Secretary. They inform us of the election of the following gentlemen to membership in the College, viz., James P. Wood, James. A. Parker, J. A. Schiedt, G. Henry Kille, B. L. Smedley, Chas. Schnabel, G. W. Carpenter, Fr. Romberg and J. Buckman.

The committee appointed at the last meeting to endeavor to prevent the passage of the "Drug Law," reported, through James T. Shinn, that they had prepared a remonstranee to be sent to the Legislature at Harrisburg, but in consequence of the defeat of the measure, they found it unnecessary to proceed further in the matter.

Thomas S. Wiegand, Chairman of the Sinking Fund Committee, reported that the remaining scrip of the College had been all paid off, in accordance with the resolution adopted at the last meeting.

A letter from W. Erasmus, of Riga, Russia, to the President of the College was read. It informs that the President of the Riga Pharmaceutical Society, M. Carl Frederking, will, on the 16th of July, celebrate the fiftieth anniversary of his connection with Pharmacy.

On motion, a committee, consisting of Professor John M. Maisch, Alfred B. Taylor and James T. Shinn, was appointed to prepare and transmit a letter of congratulation to our honorary member on this interesting anniversary.

Thomas S. Wiegand, on behalf of the committee on deceased members, presented the following report:

On May 26th, 1872, Llewellyn S. Haskell, an associate member of this College, died at Santa Barbara, in the 57th year of his age. He had been engaged in the drug business in his native State (Maine), and removed to Philadelphia, where he was employed by W. & L. Krumbhaar, and upon their retirement from business, entered into partnership with the late Jos. Reakirt, in conducting the wholesale drug business, on the premises formerly occupied by the Krumbhaar's; about eight years after he removed to New York, where he was still interested in the drug business for several years. He was a man of great activity, fluent in conversation, and of easy address; he was well informed on matters relating to the drug business, having paid especial attention to chemical studies, both in business and in the laboratory of Professors Booth and Boyé.

Mr. Haskell's health had been delicate for a number of years previous to his death, and it was in hopes of recovery that the last journey he made was undertaken.

In private life he was pure and loving, and many friends will long lament his death.

The report was accepted, and directed to be placed at the disposal of the Publication Committee.

Prof. J. M. Maisch brought to the notice of the College the death of Prof. Liebig, of Munich, and Dr. Casselmann, of St. Petersburg. A. B. Taylor also mentioned the decease of Richard W. Test, of Camden, N.J., which event had just transpired.

Prof. Maisch presented to the College from Mr. Lochman, of Carlisle, a new cork-presser, operated upon a new principle, which was accepted, and submitted to the inspection of the members.

Prof. Maisch also presented from Mr. Wilder a valuable collection of Swedish mosses.

Dr. Robert Bridges, on behalf of the widow of Dr. R. E. Griffith, presented for the use of the Library a list of the books she had previously given to the College, and which had been the property of her late husband. The catalogue embraced a number of valuable works.

On motion of J. P. Remington the books were accepted, and the thanks of the College were directed to be presented to Mrs. Griffith. The Library Committee was directed to label each of the volumes presented as being a donation from Prof. Griffith's library.

An election for delegates to attend the meeting of the American Pharmaceutical Association, at Richmond, Va., in September next, resulted in the choice of Prof. Wm. Procter, Jr., Charles Bullock, Joseph P. Remington, S. Mason McCollin and William McIntyre. At the same time an election for delegates to attend the convention of the teaching colleges, was held. Professors Robert Bridges, Wm. Procter, Jr., and John M. Maisch were chosen, with power to fill all vacancies that may occur.

Then on motion adjourned.

WILLIAM J. JENKS, *Secretary.*

Pharmaceutical Colleges and Associations.

PHILADELPHIA COLLEGE OF PHARMACY.—The Board of Trustees have lately modified the requirements for graduation, as will be observed from the advertisement of this School upon another page. Hereafter persons will not be eligible for the diploma of *Graduate in Pharmacy* unless they have served their apprenticeship in a store or stores where prescriptions are compounded. Persons apprenticed to wholesale druggists or manufacturers may, after the usual examinations, obtain a Certificate of Proficiency in Materia Medica and Chemistry, and, after a subsequent service of two years in a prescription store, and the successful passing of an examination in theoretical and practical pharmacy, will then receive the Diploma of the College. We understand that matriculants of the College of former years will be permitted, until the spring of 1874, to compete for the diploma of graduate, under the old regulations.

Maryland College of Pharmacy.—At the stated meeting, held on the 10th of July, the semi-annual election of officers resulted in the election of John F. Hancock President, and the re-election of Edwin Eareckson Secretary, J. Brown Baxley Treasurer, and Louis Dohme one of the Examiners.

The following gentlemen were elected delegates to represent the College at the meeting of the American Pharmaceutical Association, to meet at Richmond, in September. L. Dohme, N. Hynson Jennings, J. Harry Hancock, Wm. Silver Thompson, and J. F. Hancock; alternates F. Hassencamp, A. P. Sharp, Wm. H. Osbourn, J. Newport Potts and A. N. Marion.

Messrs. J. Faris Moore, Louis Dohme, Wm. Silver Thompson, Joseph Roberts and A. P. Sharp were elected delegates to the Conference of Colleges, to be held at the same time and place.

The Louisville College of Pharmacy has changed the requirements for graduation so that applicants for the diploma of this College must have served an apprenticeship of four years in a prescription store, or of not less than two years in a prescription store, and of two years to the wholesale drug business.

The recent action of the Louisville and of the Philadelphia Colleges harmonizes to a greater extent than was the case heretofore, the qualification of *experience*, as required by the teaching Colleges of Pharmacy, that of New York having made a similar change some months since.

Chicago College of Pharmacy.—At the meeting held June 11th the following members were elected delegates to the next annual meeting of the American Pharmaceutical Association and to the Convention of the Teaching Colleges of Pharmacy: Thomas N. Jamieson, Albert E. Ebert, George Buck, E. H. Sargent and Theo. H. Patterson.

The Board of Trustees was empowered to co-operate with any movement that may be made for holding a Convention of Pharmacists of the Northwest during the October exposition in Chicago.

After the consideration and adoption of some changes in the By-Laws, Mr. E. H. Sargent, in behalf of the Committee on the Attfield Testimonial, presented to the College an oil painting of Professor J. Attfield, who, the chairman said, "stands to us as the representative of that noble band of English pharmacists who so generously and promptly came to our aid in the time of our great adversity." The portrait was received by the President of the College, Mr. Thos. Whitfield, and then directed to be placed on exhibition, with a suitable inscription, in the Chicago Art Gallery.

St Clair Pharmaceutical Association of Southern Illinois.—We acknowledge the receipt of a copy of the Statutes of this Association, which was organized April 23d last, and incorporated May 20th. The following is stated to be the *object of the Association:*

The object of this Association shall be to unite all Practical Pharmaceutists of Southern Illinois for the purpose of promoting the interest, the development, the welfare and progress of the Pharmaceutical Science and Art, and also of improving, elevating and protecting our professional standing in public

life. It shall be furthermore the future aim of this Association to erect a School of Pharmacy for the Southern part of this State, at the city of Belleville, as soon as possible and practicable, in order to educate therein theoretically and practically studied Pharmaceutists, so that our worthy profession may derive honor, and the medical faculty as well as the public in general may receive benefit by it.

We sincerely wish good success to every pharmaceutical association devoting its energies to the welfare and progress of pharmacy, but we trust that our friends of Southern Illinois will well weigh the apparent necessities before they attempt to carry out their aim to establish a School of Pharmacy. Pharmaceutical education in the United States knows no geographical limits, and is not confined by narrow State boundaries; an indefinite multiplication of pharmaceutical schools could, in our opinion, be hardly otherwise than unfortunate in its results. Belleville, we believe, is distant but twelve or fifteen miles from St. Louis, where, for a number of years, a college of pharmacy has been struggling for a foothold, which it now seems to have gained, and will doubtless maintain if it receives the hearty support of all those pharmacists of St. Louis and vicinity who acknowledge the value of pharmaceutical education.

Pharmaceutical Society of Paris.—At the meeting held May 7th, a paper by Mr. Carles, On a New Variety of Opium,* was read and discussed. Mr. Boudet spoke of a paper by Mr. Chautard, read before the Academy of Medicine, On the Spectrum of Chlorophyll. Mr. Buignet stated the principal results to be as follows: A solution of chlorophyll shows in the spectrum between the red and orange a large absorption band; with the micrometer of the field divided into 100 parts and its position regulated so that the sodium line, D, corresponds with 40, the black band occupies the space between the points 22 and 30. If to the chlorophyll solution a small quantity of caustic potassa or soda is added, the central portion of the band acquires its luminosity, so that two dark lines are now perceived, corresponding to the extreme edges of the primitive band, and consequently situated at 22 and 30 of the micrometer.

A report by Messrs. Mialhe, Lefort and Latour, on iodized tar water and syrup, recommended by Mr. Bretet, of Cusset, was read; the iodine it appears is partly taken up to form substitution compounds with the constituents of the tar, a portion being converted into hydriodic acid.

Mr. Grassi exhibited ceresin (see page 11 of our January number). Mr. Guichard spoke of the crystallized benzoic acid exhibited by him before (see June number p. 282), some crystals weighing 0·7 grams and having the crystalline form of gypsum; he was unable to crystallize ordinary benzoic acid in any other form except the well known small plates.

Mr. Latour presented specimens of fused nitrate of zinc and of caustic pencils made from it. The concentrated solution, a paste made from it with wheat flour, mixtures of the nitrate and chloride of zinc and the pencils have been used as caustics in the Hôtel-Dieu at Lyons.

Mr. Roucher recommends the addition of a little glycerin to plasters, to

* See American Journal of Pharmacy, July, page 314.

prevent them from breaking too readily. Mr. Desnoix said that the same result is obtained if the glycerin is not washed out of the lead plaster.

At the meeting held June 4th Mr. Stan. Martin exhibited Persian opium in sticks, from which, by the ordinary processes, no morphia could be obtained; also a sample of kino from Soudan which is unknown in Europe. When examined by the microscope it does not appear to have been subjected to any particular manipulation; water dissolves 80 per cent of it; its low price recommends it for use in the arts.

Mr. Gosselet, Vice-President of the Pharmaceutical Society of Northern France, communicated by letter a decision by the court of Douai, that cod-liver oil is to be regarded as an aliment, and may be sold by grocers. Some questions submitted by the district attorney were discussed, and by the Society of Paris unanimously decided as follows: Cod-liver oil is a simple drug and a true medicine, and should not be sold in medicinal quantities by druggists or grocers; there is a distinction to be made between the oil prepared according to the pharmacopœia by a particular process for internal use, and that used by tanners, which is usually more or less impure fish oil.

Mr. L. Soubeiran communicated an extract of a letter from Mr. J. E. Howard, informing that he had planted in the open air near Cottenham several specimens of Cinchona calisaya, which are thriving well; he adds that Professor Baillon has had a similar experience this year near Paris.

Mr. Planchon, in behalf of Prof. Flückiger, presented a detailed inventory of a pharmacy at Dijon from the year 1439. It is a curious document, and valuable for the history of pharmacy.

Mr. Toselli, by invitation, exhibited his apparatus for making ice, and produced in five minutes a block weighing 500 grams, using nitrate of ammonium by dissolving it in water, as the source of cold. Mr. Poggiale regards the apparatus as very ingenious, but believes that of Mr. Carré preferable, because it does not require the transportation of material at an elevated price for the production of the ice.

Mr. Mayet read a note on the preparation of antiscorbutic syrup from a fluid extract; this created considerable discussion in favor of and in opposition to the proposed change. It appears that the fluid extracts and concentrated tinctures now met with in French commerce are often worthless preparations; Mr. Mayet therefore proposes to critically experiment with the processes.

Mr. Boudet reported that the Minister of Public Instruction, on behalf of the Minister of War, had addressed a letter to the Academy of Medicin, requesting an opinion on the fusion of military medicin and pharmacy, on the subordination of the latter to the former, or on maintaining their present relations. The Academy has appointed a committee of nine, only three of which number, the Pharmaceutical Society regrets to hear, are pharmacists, while six are physicians. Mr. Poggiale, a member of the committee, believes that the Academy will decide in favor of the present status.

The General Pharmaceutical Association of Belgium met in the free university of Brussels, May 4th last. The principal business transacted was the consideration of the amended constitution; as adopted every member has

the right to vote, personally if present, or by proxy if absent. The officers were re-elected as follows: Victor Pasquier, President; De Bauque, N. Gille, Van Bastelair and Van Pelt, Vice-Presidents; E. Vande Vyvere, Secretary, and Vanden Heuvel, Assistant Secretary.

Editorial Department.

The Twenty-First Annual Meeting of the American Pharmaceutical Association will convene at the Virginia Opera House (formerly Virginia Hall), in the city of Richmond, on Tuesday, the 16th day of September, at 3 o'clock P.M. The following arrangements have been made for visiting members: those from the Eastern cities will leave Baltimore on Monday, the 15th of September, at 4 o'clock P.M., by the York river line of steamers, the trains leaving New York at 9 A.M. and Philadelphia at 12.15 M., making close connections. The steamers will reach West Point at 8.30 A.M. on Tuesday, the party arriving in Richmond at 11 o'clock the same morning. A reduction of fare from Baltimore has been secured; but the members are requested to inform Mr. J. F. Hancock, corner of Baltimore and Caroline streets, Baltimore, in advance, of the number of berths required, and the time of their arrival in that city. No other reduction of the fare could be secured by the Permanent Secretary for the Eastern members.

The following excursion has been arranged for the Western members: they will leave Cincinnati on Friday, September 12th, at 4 o'clock P.M., for Huntington, by steamer, arriving there the next morning at 9 o'clock; thence by rail to White Sulphur Springs, where they will spend Sunday, leaving again Monday morning and arriving at Richmond at 5 P.M. the same day. Fare from Cincinnati to Richmond, $17. Members and their families going by this route, are requested to give timely information to Prof. J. F. Judge, corner of Court and Cutter streets, Cincinnati. They will be passed back over the same route *free of charge* upon presenting a certificate from the Secretary.

The headquarters of the members at Richmond will be at the "Exchange Hotel and Ballard House," where ample accommodations and a reduction from the regular charges have been secured.

An excursion of the members to Petersburg, Va., has been proposed for one afternoon, and a visit to Mount Vernon after the final adjournment of the Association. Members intending to participate are requested to inform the Secretary, after their arrival in Richmond, of the number of tickets required, when the expenses of each trip will be made known.

Goods intended for exhibition should reach Richmond on Monday, and be sent free of charge, directed to the Association, at the Virginia Opera House, notice being given to the Secretary stating the space required.

The General Index to the American Journal of Pharmacy, we are glad to observe, meets with that appreciation which it deserves for its elaborateness.

Among the letters which we have received about Mr. Wilder's work, we publish the following, from Mr. Henry C. Morse, of Elmira, N. Y., not merely because it deservedly praises the book in question, but because it contains a suggestion which is worthy of adoption by all who occasionally or often may have to consult the later volumes of the "Journal." Mr. Morse says:

I have made a very careful examination of its contents, and find it, without any exception, the most complete and thorough as to matter and most perfect as to arrangement of any work of like nature that has come under my observation, exhibiting a very large amount of careful, patient and exceedingly hard work.

Allow me to suggest that subscribers may continue the work in all its perfection by having a blank leaf placed between each two leaves of the printed book when bound, and make additions with pen and ink as each new volume is issued. By so doing, each subscriber will virtually have the "General Index" always complete to the present time.

Aromatic Spirit of Ammonia.—A correspondent has met with difficulties in making this preparation, as he thinks, strictly according to the Pharmacopœia. At one time he observed in the bottle used for the purpose, a thick sediment about an inch in depth; at another time the sediment was only about $\frac{1}{8}$ inch in thickness, and when he made the spirit a third time there was no precipitate whatever.

The translucent officinal carbonate of ammonium may be regarded as sesquicarbonate of ammonium, or as a chemical combination between the mono- and bicarbonates of ammonium. The sesquicarbonate is insoluble in alcohol, by which liquid it is decomposed into monocarbonate, which dissolves, and bicarbonate, which precipitates. The addition of ammonia water, as directed by the Pharmacopœia, converts this insoluble bicarbonate into soluble monocarbonate; hence, if the ammonia water used is weaker than the officinal, the quantity directed is insufficient to dissolve *all* the bicarbonate, and consequently leaves a sediment.

On exposing the officinal translucent sesquicarbonate to the atmosphere, it becomes opaque, white, and finally pulverulent, at the same time becoming much weaker in odor; monocarbonate of ammonium has been lost by evaporation, and bicarbonate is left behind, which, to be converted into soluble (in alcohol) m nocarbonate, requires a *much larger* amount of ammonia water than is needed for the same purpose by the officinal salt.

The causes of failure in making this preparation are, therefore, an ammonia water weaker than the officinal, and (2) an opaque or effloresced carbonate of ammonium. If the material employed is strictly that directed by the Pharmacopœia, no sediment will occur.

Collusion between Physicians and Pharmacists.—We have on several occasions referred to a species of fraud, the result of a compact between physician and pharmacist, of which of course the patient is the intended victim, and which is consummated by the former writing his prescriptions in a manner that they can be deciphered only by the second party of the understanding. The following, which is taken from a correspondence placed at our disposal,

furnishes another illustration of the manner in which this arrangement is carried out.

Two prescriptions were received by a friend of ours, as follows:

℞. Mc F 904 ℥iv. Sig. Use as directed.

℞. McF pulv. (C) No. xv. Sig. One every three hours.

To a note dispatched to the prescribing physician, asking for the formulas, the following answer was received:

Dear Sir,—The prescription 904 404 is private. You can get it at W——'s drug store. Yours, &c., J. McF.

Further comment is unnecessary.

Adulterations by "Neutral Oil."—The following circular, received by us, exhibits a surprising degree of barefacedness and of confidence into the dishonesty of the wholesale drug trade. We have no means of ascertaining to what extent the circular has been distributed or was responded to; but we would advise all interested to be on the look-out for adulterations by "neutral oil." What kind of an oil this latter article is we are unable to say, but should be glad to receive a sample for experimental purposes. Leaving out the names &c., the circular reads as follows:

Western Oil Company, Manufacturers of Animal and Vegetable Oils, Car and Axle Grease.

Special Circular to Wholesale Druggists.

Gentlemen,—We call your attention to our "Neutral Oil," *made expressly to manipulate lard oil, raw and boiled linseed, refined cotton-seed oil, and castor oils; also used extensively for wetting down wool.* It does not stain. One trial will convince you it will enable you, to make large profits on articles that heretofore hardly paid to handle. No orders filled less than a barrel. Prices as follows: One barrel, 48 cents per gallon, &c. Our prices are firm at above quotations. Trusting to receive a sample order, we &c.

OBITUARY.

Gustav Rose, the celebrated mineralogist and chemist, died July 21, having passed his 75th year in March last. His father and grandfather, both named Valentine, kept an apothecary store in Berlin, Germany, and became noted for their researches in chemistry; his brother, who had been raised a pharmacist, was the celebrated analytical chemist, Henry Rose, who died in 1864. Gustavus Rose studied mineralogy and chemistry in Berlin and Stockholm; in 1821, at the age of 23 years, he became Custodian of the Mineralogical Cabinet of the Berlin University, in 1826 Professor Extraordinary, and in 1839 Ordinary Professor of Mineralogy. In 1829 he and Ehrenberg accompanied Alexander Von Humboldt upon a scientific journey to the Ural Mountains and the Caspian Sea, which he described in a work of two volumes; his other important publications were all devoted to mineralogy and crystallography.